SECTOR COMPETITIVENESS FRAMEWORKS

PLASTIC PRODUCTS

PART 1 – OVERVIEW AND PROSPECTS

Industry Sector
Advanced Materials and Plastics

Secteur de l'industrie
Matériaux de pointe et produits en matière plastique

Canada

PLASTIC PRODUCTS

PART 1 – OVERVIEW AND PROSPECTS

PREPARED BY:
ADVANCED MATERIALS AND PLASTICS BRANCH

This *Overview and Prospects* is the first of two companion documents on Plastic Products in the **Sector Competitiveness Frameworks** series, which is being produced by Industry Canada in partnership with Canada's key stakeholders in the industry. *Part 2 — Framework for Action* will be prepared in coming months, based on consultations with major industry stakeholders, following study and review of the *Overview and Prospects*.

The **Sector Competitiveness Frameworks** series will focus on the opportunities, both domestic and international, as well as on the challenges facing each sector. The objective is to seek ways in which government and private industry together can strengthen Canada's competitiveness and, in doing so, generate jobs and growth.

In all, some 29 industrial sectors will be analyzed. *Part 1 — Overview and Prospects* will be available for distribution in printed as well as electronic forms during coming months for the following industries:

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FOREWORD

The new Canadian marketplace is expanding from national to global horizons and its economic base is shifting increasingly from resources to knowledge. These trends are causing Canadian industries to readjust their business approaches, and government must respond with new tools to help them adapt and innovate. Industry Canada is moving forward with strategic information products and services in support of this industry reorientation. The goal is to aid the private sector in what it is best qualified to do — create jobs and growth.

Sector Competitiveness Frameworks are a series of studies published by Industry Canada to provide more focussed, timely and relevant expertise about businesses and industries. They identify sectors or subsectors having potential for increased exports and other opportunities leading to jobs and growth. In 1996–97, they will cover 29 of Canada's key manufacturing and service sectors.

While they deal with "nuts and bolts" issues affecting individual sectors, the Sector Competitiveness Frameworks also provide comprehensive analyses of policy issues cutting across all sectors. These issues include investment and financing, trade and export strategies, technological innovation and adaptation, human resources, the environment and sustainable development. A thorough understanding of how to capitalize on these issues is essential for a dynamic, job-creating economy.

Both government and the private sector must develop and perfect the ability to address competitive challenges and respond to opportunities. The Sector Competitiveness Frameworks illustrate how government and industry can commit to mutually beneficial goals and actions.

The Sector Competitiveness Frameworks are being published sequentially in two parts. An initial *Overview and Prospects* document profiles each sector in turn, examining trends and prospects. The follow-up *Framework for Action* draws upon consultations and input arising from industry–government collaboration, and identifies immediate to medium-term steps that both can take to improve sectoral competitiveness.

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1 HIGHLIGHTS

The plastic products industry transforms synthetic resins into a wide range of finished plastic products and semi-finished parts for other manufactured goods using a variety of fabricating methods. About 80 percent of total output goes to three main end-use markets: packaging, construction products and automotive parts.

Strong linkages exist between plastic products and other industries — synthetic resins, machinery and mould manufacturing, and a wide range of downstream customer industries.

Very low research and development (R&D) spending relative to all manufacturing indicates that the Canadian plastics industry has not been self-reliant in innovation. Traditionally, much of the new technology has originated with resin and machinery suppliers. Domestic resin producers not only provide a direct supply of raw materials, but also create a technical infrastructure in support of at least the larger firms in the processing industry.

The overwhelming majority of firms have sales of less than $5 million, and over half have sales of less than $2 million. A significant part of plastic production takes place as a secondary activity by firms in other industry groups, and by still others who produce them for consumption internally.

In 1995, the industry comprised about 1200 establishments, generated $9.5 billion in sales and directly employed 67 000 people. Businesses in which plastic production is a secondary activity or is carried out for internal consumption involved almost another 1000 establishments, producing the equivalent of an additional $7.5 billion in sales and employing another 36 000 people in the same year. For the purposes of this study, secondary production and in-house consumption have been excluded from discussion unless otherwise specified.

Wages in the plastic products industry tend to be lower than in other manufacturing industries. The industry is relatively labour intensive, it is not heavily unionized and there is a continuing need to further raise skill levels.

The plastic products industry entered a very high-growth phase in the 1960s. Its continuous growth trend was interrupted only by the mid-1970s oil crisis and the 1981–82 and 1990–92 recessions. Growth is continuing strongly in the 1990s. The plastic products industry is a high-growth industry whose average annual growth rate continues to be nearly double that of all manufacturing.

1.1 Major Trends

Canadian and worldwide demand for plastic products are expected to continue growing faster than the economy as a whole, although not as rapidly as in the past.

Like many industries, the plastic products industry is experiencing an accelerated rate of technological change. Supplier industries have also undergone rationalization and no longer provide the same degree of technical service as in the past, usually to the detriment of the small and medium-sized firms that characterize the Canadian industry. The latter have not cultivated the financial resources to make longer-term investments such as R&D and, as a result, few have established competitive advantage through product differentiation.

As with other industries composed largely of small and medium-sized firms, there is ongoing difficulty in obtaining financing. Within the industry, there is a feeling that the banks do not understand the industry or its companies. An effort is under way through the industry association to address this issue.

Superimposed on high overall growth within the industry and notwithstanding the challenges noted above, establishments employing 50–99 people (with shipments of $5–15 million) have exhibited particularly strong performance, becoming responsible for an ever-increasing share of industry output over the past decade.

Implementation of the Canada–U.S. Free Trade Agreement (FTA) in 1989 and the North American Free Trade Agreement (NAFTA) between Canada, the United States and Mexico in 1994, encouraged the industry to rationalize on a North American basis. The Canadian plastic products industry has shifted from a domestic market orientation serving local and regional markets in a tariff-protected environment to one seeking a place in the larger North American market. Often this rationalization has occurred in response to changes within customer industries. For example, if a food processor consolidates its business in the U.S., the Canadian supplier of plastics packaging must react to reflect that change, or it will lose the business. Certain segments of the plastic products processing industry, such as pipe, profile and film, have consolidated and do compete on a North American basis, but the overall industry is still fragmented. For many products, transportation costs preclude direct export to distant markets. In these cases, Canadian companies should seek joint venture, acquisition or alliance opportunities that enable them to extend their reach by exporting and exchanging technology.

An observed productivity gap between Canada and the United States has direct implications for human resources development. As companies move toward a stronger emphasis on technology, there is a parallel need to upgrade the skill level of the work force to utilize new technology effectively. There is some evidence of improvement in the knowledge levels within the industry, but the need to raise skill levels and retain skilled workers remain issues.

In many cases, the use of plastics in place of other materials has a significant positive effect on sustainable development. At the same time, environmental concerns have the potential to restrict growth of this industry. Solid waste management, challenges to the use of polyvinyl chloride (PVC), and possible links between plastics and endocrine disruptors are the issues of greatest current concern.

1.2 The Bottom Line

The plastic products industry is a high-growth industry, and has broad and rapidly growing industrial and consumer applications.

Nevertheless, the industry faces a number of major competitiveness issues:

- the small size of many Canadian establishments
- the fact that relatively few firms are undertaking in-house R&D, despite the accelerating rate of technological change in the industry
- the need to increase exports and to encourage more firms to export
- the challenge of addressing environmental issues
- the ability to meet technology and skill requirements while maintaining cost competitiveness, primarily with nearby U.S. competitors.

2 KEY POINTS ABOUT THIS INDUSTRY

Plastic products are primarily captured by Statistics Canada's 1980 Standard Industrial Classification (SIC) under major group 16, Plastic Products Industry, and under SIC 3256, Plastic Parts and Accessories for the Motor Vehicle Industry. Unless otherwise noted, it is the sum of these two parts that are discussed in this document.

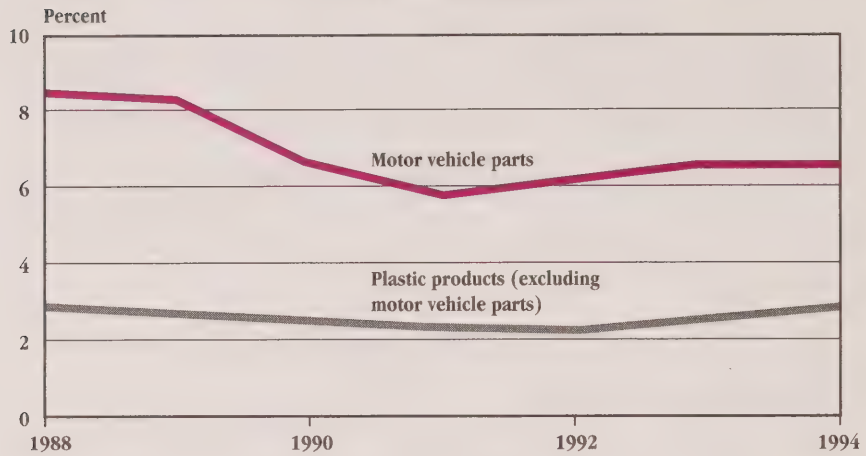
2.1 Global Context

Canada produces about 2.1 percent of the total world volume of plastic products, based on its proportion of world resin consumption and assuming that the rate of conversion from resins to products is the same the world over.

Canada exports plastic products mainly to U.S.

Another means of measure indicates that Canada was responsible for 3.1 percent of total world exports of plastic products in 1994 (Figure 1). In that year, commensurate with its role in the world automotive industry, Canada's share of plastic automotive parts exports was over 6 percent, while the share in non-automotive products was just under 3 percent. Both numbers have risen since the 1990–92 recession. Geographically, Canada's largest foreign market by far is the United States, which took 91 percent of our exports in 1995. The balance was distributed broadly among the other regions of the world.

Figure 1. Canada's Share of World Export Markets for Plastic Products



Source: Statistics Canada, *World Trade Data Base*, CD-ROM, 1996.

2.2 North American Context

North America, the largest consumer of plastics in the world, provides a market for plastic products of roughly US$110 billion. The Canadian industry supplies about 2 percent of the U.S. market and about 6 percent of the entire North American market.

The plastics industry is a regionalized, fragmented industry in most parts of the world

In Canada, as in the U.S. and Mexico, the plastic products industry is fragmented. There is a large number of firms operating in each market segment, and even the largest companies generally consist of several regional-scale plants that cater to the needs of local customers. While there is a high degree of similarity in processes used and products made, there are some differences between Canadian and U.S. consumer preferences, such as the popularity of milk pouches in Canada versus milk jugs in the United States.

2.3 Canadian Industry Snapshot

Although the first plastics date back more than a century, the real advent of petrochemical-based polymers occurred during the 1930s, with rapid innovation taking place during the Second World War and the immediate post-war period. By the 1960s, all of the key commodity resins and a large number of engineering resins were developed, and the machinery infrastructure was sufficiently established to allow the commercial plastic products industry to enter its high-growth phase. Advances on the supply side over the past three decades have focussed on modifying the basic polymer groups to meet specific needs as well as on the development of new, higher-performance engineering resins.

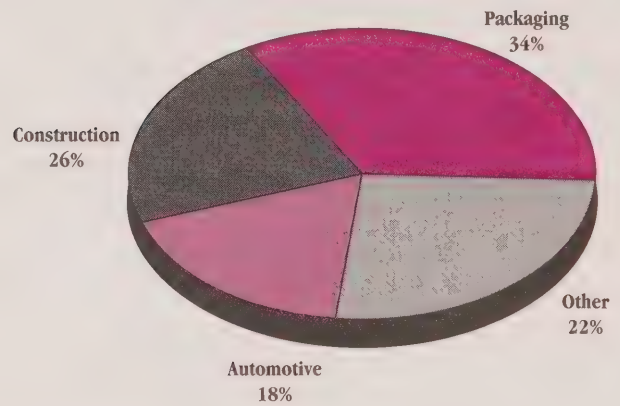
The plastic products industry began during WWII, boomed in 1960s

Plastics are used by virtually every end-use segment of the economy. The unique attributes of plastics (including processability, light weight and corrosion resistance) have led to the creation of new products, and plastics have also displaced paper, glass and metal from traditional applications. Although there is a wide range of plastic products, three major product lines dominate: 34 percent of shipments are packaging, 26 percent are construction products, and 18 percent are automotive components (Figure 2). With regard to export

Plastics are used in three major applications: packaging, construction products and automotive components

orientation, exports amounted to $3 billion or over 31 percent of the value of total shipments in 1995. On the other side of the coin, imports ($3.9 billion in 1995) accounted for 37 percent of the domestic Canadian market for plastic products. From an international market perspective, Canada's trade is heavily skewed toward the U.S., which took 91 percent of our exports of plastic products in 1995 and supplied 78 percent of our imports.

Figure 2. End-use Markets



Source: Statistics Canada, special request, 1995.

60% of larger firms are Canadian-owned

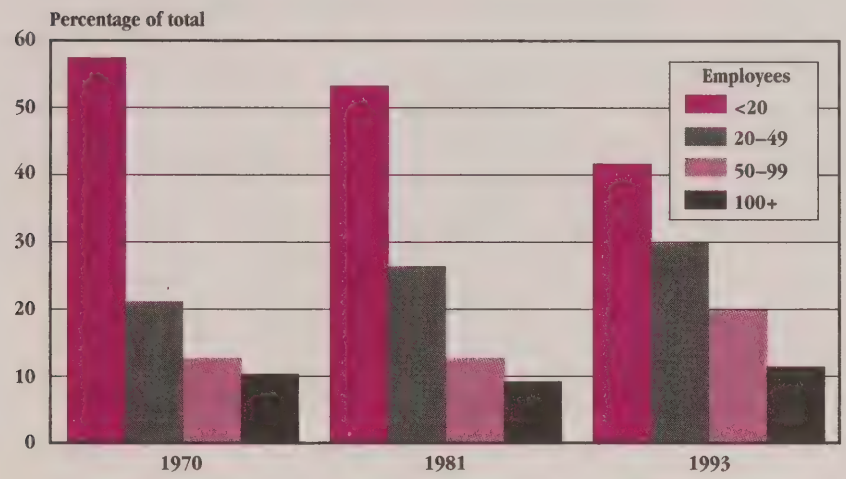
The plastics processing industry is characterized by a large number of small and medium-sized enterprises (SMEs) that are almost all Canadian-owned and a few large firms, 60 percent of which are Canadian-owned; overall, this industry is 95 percent Canadian-owned.

Shipments in 1995 were $9.5B

The plastics industry employs 67 000 people

Today in Canada, the primary activity of about 1200 establishments is the processing of synthetic resins into plastic products. In 1995, this industry generated shipments valued at $9.5 billion and employed 67 000 people — an average of 56 people and $7.9 million worth of shipments per plant. The overwhelming majority of firms are SMEs with fewer than 50 employees and sales of less than $5 million. However, the average plant's size and sales level are rising, and the disparity between large and small is becoming progressively less pronounced (Figure 3).

Figure 3. Changing Size Distribution of Establishments[a]

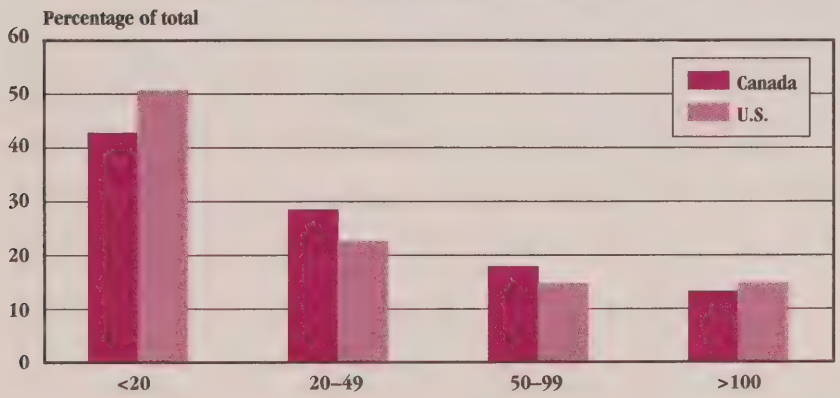


[a] Does not include establishments that manufacture automotive parts.

Source: Statistics Canada, Catalogue No. 31-203, annual.

In comparison, the U.S. industry, which is Canada's largest competitor, has some much larger establishments (Figure 4). In Canada, establishments employing 100 or more people represent 11 percent of the total, and account for 44 percent of shipments. In the United States, such establishments represent 14 percent of the industry and supply 63 percent of total shipments.

Figure 4. Size Distribution of Plastic Industry Establishments,[a] 1992



[a] Does not include establishments that manufacture automotive parts.

Source: Statistics Canada, Catalogue No. 31-203, annual; U.S. Department of Commerce, *Census of Manufactures for Industry 308*, annual.

However, the average firm size is not significantly different, being about 20 percent larger (52 versus 43 employees per establishment in 1992), and the size distribution is much the same.

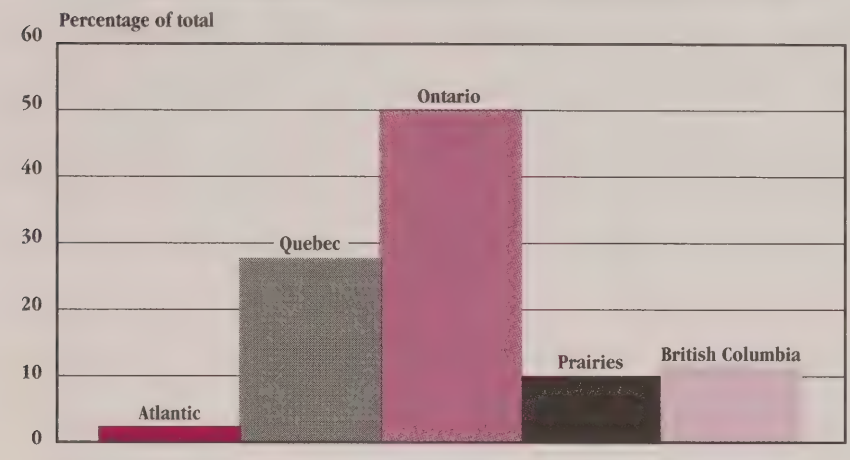
Including plastics production from all industries as well as in-house consumption, total number of establishments engaged in plastics processing activity rises to 2100, total output to $17B and total number of people employed to 103 700

In addition to being produced by companies within the defined plastic products industry, plastics production is a secondary activity of firms in other industry groups, both for the market (for example, plastic toys and furniture) and for internal consumption (such as plastic bottles made in-house by a shampoo manufacturer). When the activity of these firms is taken into account, the total number of Canadian establishments engaged in plastics processing of some form in 1995 was 2100, producing a total output of plastic products equivalent to $17 billion, and directly employing 103 700 people. This broader view is useful for some purposes, such as looking at the links to resin producers, but for the most part, the analysis in this paper focusses on the narrower definition of the industry (see statistical tables in Annex A).

Half of Canadian plastic products industry is in Ontario; one quarter is in Quebec

Over the past 10 years, the regional distribution of the industry has not changed substantially. Fifty percent of all establishments are located in Ontario, 27 percent in Quebec, 11 percent in British Columbia, 10 percent in the Prairie provinces and 2 percent in the Atlantic provinces (Figure 5). Based on either value of shipments or employment, about 65 percent of the industry overall and almost the entire automotive components subsector is in Ontario.

Figure 5. Regional Distribution of Establishments, 1994



Source: Statistics Canada, CANSIM Matrices 5413 and 5560, annual.

Of the 17 major plastics processors in Canada profiled in Annex B, six are privately held and 11 are publicly traded; 12 are Canadian-owned and five are foreign-owned. Total sales of these 17 were about $5 billion in 1995. Most of these large firms tend to specialize in one end-use market. Seven are primarily producers of packaging, four are in construction products, three make automotive components and the other three are diversified. Woodbridge Foam, Decoma (a subsidiary of Magna) and Royal Plastics are the largest plastics processors in Canada, each with sales over $500 million.

17 large companies operate about 140 establishments and account for over 50 % of industry shipments

The major association for the plastics industry is the Canadian Plastics Industry Association (CPIA). The CPIA was created in 1996 (legal entity on January 1, 1997) through a merger of the Society of the Plastics Industry of Canada, the Environment and Plastics Institute of Canada, and the Canadian Plastics Institute. The CPIA represents the interests of the vertically integrated plastics industry, including plastics processors, and the suppliers of resins, machinery and moulds.

"The Canadian plastics industry has been one of the most dynamic sectors in the second half of the 20th century."
— Pierre Dubois, President and CEO, CPIA

The new association will be regionally driven, with supporting infrastructure in four regions: western Canada, Ontario, Quebec and Atlantic Canada. In addition, there will be a national organization providing common services to the regions. At the time of writing, the details regarding the finer elements of the association structure were still under discussion.

Plastics processing activity accounts for 0.9% of GDP, 0.8% of total national employment and 6.0% of manufacturing employment

The plastics processing industry accounts for 0.5 percent of national gross domestic product (GDP), 0.5 percent of total national employment and 3.9 percent of manufacturing employment. When the estimates of plastics processing activity by other firms not formally included in the plastics industry are included, these shares rise to 0.9 percent of GDP, 0.8 percent of total employment and 6.0 percent of manufacturing employment.

Beyond this statistical view of the contribution of the industry to the economy as a whole, there are extensive linkages between the plastic products industry and the rest of the economy. Early in the production chain, there are strong links from plastics processors through synthetic resin producers and primary petrochemical producers to the primary petroleum industry. Furthermore, the domestic resin producers not only provide a direct supply of raw materials, but also act as part of the technical infrastructure supporting the processing industry (although less now than formerly). Other linkages include those with machinery, mould and die suppliers, and with energy suppliers. In addition, there are growing links to reclaimers and recyclers.

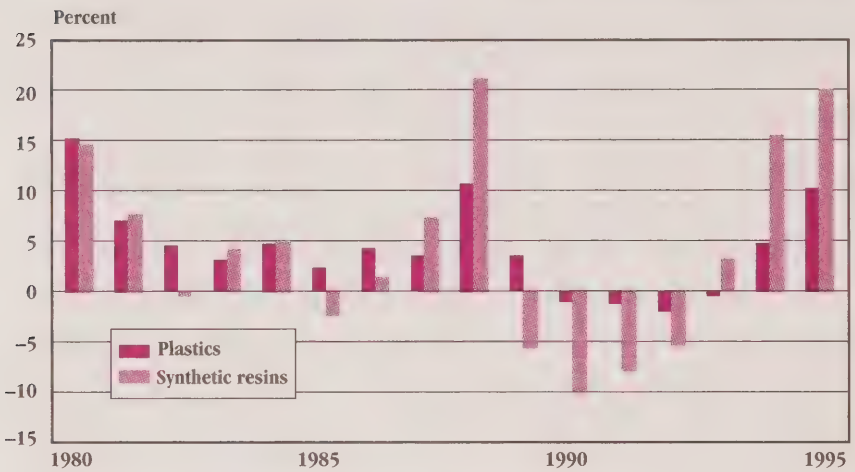
With respect to post-production linkages, about 80 percent of total plastic products output is accounted for in packaging, construction products and automotive parts (Figure 2). These provide strong links to all industries using packaging, to the construction industry and to the auto industry. Beyond these three, other markets consuming significant quantities of plastic products are electrical and electronic equipment, housewares, toys, furniture and sporting equipment.

Synthetic resin represents the most significant input to the plastics processing industry. Resin costs typically account for 30–50 percent of the final value of a plastic product. Growth in the Canadian plastics industry was fuelled by a dramatic increase in the domestic capacity for producing synthetic resins beginning in the late 1970s. This increase was a response to the first oil crisis, and decisions made by multinational enterprises to invest in downstream production using secure, western Canadian oil and gas as a feedstock. During that period, tariffs into the U.S. for resins were typically 10–12 percent, compared with rates of 3–5 percent for plastic products. As multinational enterprises built world-scale resin capacity in Canada, there was an incentive for them to support expansion of the Canadian customer base as a means for selling as much resin as possible domestically to avoid export tariffs. Multinational resin companies also became integrated downstream into plastics processing as a means for indirectly exporting their resin, in the form of products, and thus receiving preferred tariff treatment.

Since the 1970s oil crisis, Canada has produced much of the required resin

Fluctuations in resin prices have a strong impact on the industry (Figure 6). During times of rising resin prices, plastics processors are not always able to pass increases along immediately, creating significant pressure on profit margins.

Figure 6. Annual Price Changes for Plastics and Synthetic Resins [a]



[a] Does not include establishments that manufacture automotive parts.

Source: Statistics Canada, CANSIM Matrix 2008, annual.

Technological Change

In addition to their own proprietary product and process technologies, plastics processors benefit from the innovations made in machinery, moulds and synthetic resins. These supplier industries have undergone rationalization on a North American basis following implementation of the Canada–U.S. Free Trade Agreement (FTA) and no longer provide the same degree of technical service as they once did. This has slowed diffusion of technology from suppliers, mostly to the detriment of the SMEs, which characterize the Canadian industry. Furthermore, these smaller firms have not collectively cultivated the financial resources to make longer-term investments in areas such as research and development (R&D) and, as a result, few have established a competitive advantage through product differentiation.

Human Resources

The plastic products industry is relatively labour intensive, is not heavily unionized (perhaps 10–15 percent) and average wages are about 30 percent lower than in all manufacturing. There are shortages of process engineers, set-up people, mould and die makers and maintenance personnel. A recent study projects that without corrective action, this imbalance will worsen. Throughout the industry, a large number of low-skill machine operators lack basic skills in polymer science, computers, communications and mathematics, all of which are becoming increasingly important, yet certain segments of the industry appear to have minimal commitment to training. The industry has a high turnover in staff.

Wages in the plastic products industry are about 30% lower than average manufacturing wages

Government Policy

Horizontal policies and regulations of greatest significance to the plastics industry are tariffs and international trade agreements, environmental standards and supporting technology infrastructure.

In the area of tariffs and international trade agreements, duties on resins of U.S. origin were phased out by 1993, and this contributed to a more competitive cost structure in Canada. Under the terms of the FTA, Canadian and U.S. tariffs on plastic products shipped between the two countries will be eliminated completely by 1998. Under the NAFTA, tariffs between Canada and Mexico will all be eliminated by 2003.

"As environmental performance expectations increase, so do the associated costs. . . . The expenses related to environmental initiatives are taken as normal business costs."

— DuPont Canada, *Annual Report*, 1995

The main piece of federal environmental legislation pertaining to the plastic products industry is the *Canadian Environmental Protection Act* (CEPA), which provides the federal government with the authority to address pollution problems on land, in water and throughout all layers of the atmosphere. The provisions of CEPA that are of greatest importance to the plastic products industry are those dealing with volatile organic compounds (VOCs), chlorofluorocarbons (CFCs), solid waste and substances identified as toxic through CEPA assessment; of 25 chemical groups so far identified as being toxic, four have potential for impact on the plastic products industry.

Since the industry is characterized by a large number of SMEs, there is a need for collective initiatives to foster greater use of technology as a means for enhancing competitiveness. Government support in the area of R&D was provided to many of these organizations during their start-up phase. The organizations discussed in the following paragraphs all play a role with respect to developing and diffusing technology to the Canadian plastics industry.

The Canadian Plastics Institute (CPI) is a not-for-profit technology diffusion centre supported by Industry Canada through annual contributions, and by the plastics industry on a fee-for-service basis. Government support will end in June 1998. The CPI forms a component of the new CPIA and is orienting itself to become sustainable beyond that point.

The Composite Materials Centre (CMC) in Saint-Jérôme, Quebec, is a specialized technology application centre whose mission is to increase economic growth in the polymer composite industry (also known as the reinforced plastics or FRP industry). The centre is a private, federally chartered, not-for-profit corporation, supported by the Quebec government, Industry Canada and industry on a fee-for-service basis.

The Environmental Science and Technology Alliance of Canada (ESTAC) is an alliance of six companies and 15 universities that undertakes precompetitive R&D in four areas including polymer science. ESTAC is supported through the annual fees of each member and a contribution from Industry Canada. Application is often made to the Natural Sciences and Engineering Research Council (NSERC) for co-funding on a project-by-project basis. Knowledge generated as a result of ESTAC-supported projects is available to all members, and all members have a right to license any technology that may emerge.

The Industrial Research and Development Institute (IRDI) is an industry-driven, not-for-profit organization established to give advanced technical and research support to Canada's tool, die and mould (TDM) industry, as well as to the related material suppliers and users of tools, dies and moulds. The institute is supported by the Ontario government, Industry Canada and industry on a membership and fee-for-service basis.

Within the federal government, the main R&D thrust related to the plastics industry is from the National Research Council. The Industrial Materials Institute has the largest group dedicated to plastics. Other significant research efforts are conducted by the Institute for Chemical Process and Environmental Technology and the Institute for Research in Construction.

"Ontario's plastic industry plays a key role in our economy . . . the industry is also vital to many other of our industries such as the automotive, construction, packaging and electronic sectors."

— Bob Rae,

Former Premier of Ontario

On a provincial level, three provincial research organizations have programs supporting the plastics industry: the Alberta Research Council, ORTECH in Ontario and le Centre de Recherche Industrielle de Quebec. Also in Ontario, there is a provincial Centre of Excellence called the Ontario Centre for Materials Research (OCMR). OCMR brings university researchers and companies with technical needs together. Plastics is one of its three main areas of focus.

In addition, a number of universities have faculty members or research groups that are active on plastics projects. These include the universities of British Columbia, Alberta, Calgary, Western Ontario, Waterloo, Toronto, McMaster, Queen's, Ottawa, McGill, École Polytechnique, Laval, Concordia and Moncton. The research programs conducted within the universities are often co-funded by industry and NSERC.

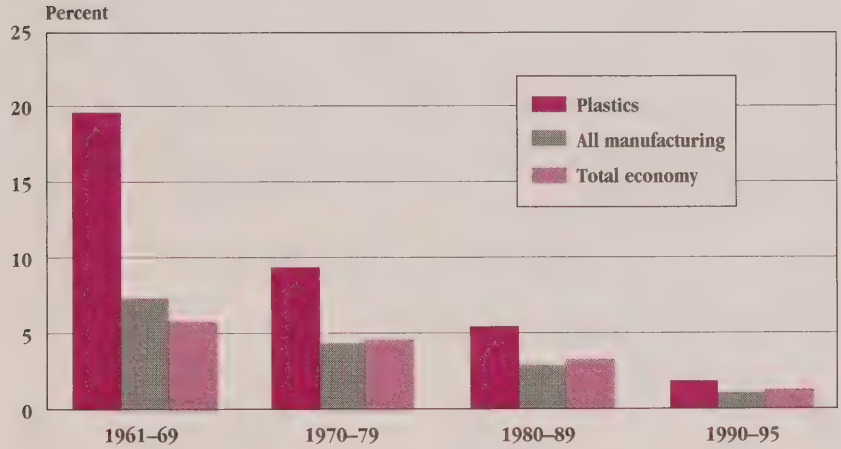
Back in the early 1990s, the industry, Revenue Canada and Industry Canada began working together to develop an application paper aimed directly at the plastics industry. Its objective was to assist the industry in making better use of the Scientific Research and Experimental Development incentive program. This culminated in 1994 with the publication of the Plastics Industry Application Paper, followed by a series of cross-country seminars to introduce it to a broader cross-section of industry.

2.4 Performance and Competitiveness Factors

Growth

The plastic products industry entered a very high-growth phase in the 1960s with an average annual growth rate of close to 20 percent. That growth has decelerated considerably since then, but then so has the growth in most industries (Figure 7). Even so, both historically and most recently, growth in the plastic products industry has outperformed both all manufacturing and the economy as a whole. Overall growth between 1990 and 1995 was low because it took until 1993 to surpass the peak observed in 1989, immediately prior to the last recession.

Figure 7. Compound Average Annual Growth in Output



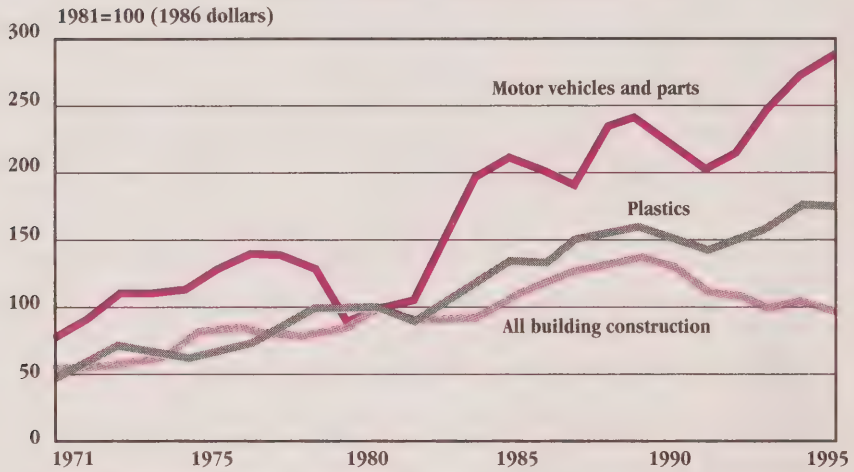
Source: Statistics Canada, CANSIM Matrix 4670, annual.

Firms shipping $5–15M showed best performance over past 10 years

Over the past decade, establishments employing 50–99 people with shipments of $5–15 million have exhibited the strongest performance, becoming responsible for an ever-increasing share of industry output.

Although two of the major markets for plastic products — the motor vehicle industry and construction — are both very cyclical, the plastic products industry itself is much less so. The rising general demand for plastics as a substitute for other materials mutes the cyclical effects (Figure 8).

Figure 8. Contribution to GDP from Plastics, Motor Vehicles and Construction



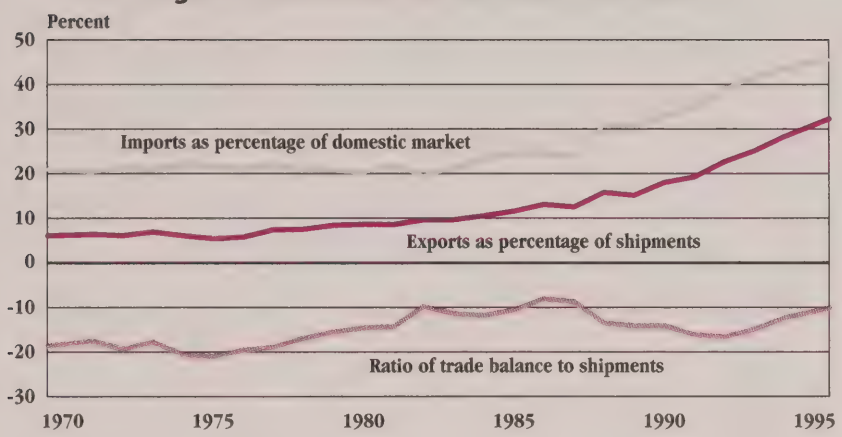
Source: Informetrica, industry spreadsheets, annual.

Trade

Canada's trade deficit of approximately $1B annually is decreasing

Since implementation of the FTA, both penetration into Canadian markets by imports and export orientation of the Canadian industry have grown quite dramatically (Figure 9). Although Canada's trade deficit in plastic products has stood at around $1 billion for the past decade, in recent years it has declined as a percentage of export sales and as a percentage of shipments (Figure 9), which are measures of our ability to fund the deficit. In 1995, roughly one third of Canada's trade deficit was with the United States (down from 44 percent in 1994). The next largest deficits were with China and Taiwan, followed by Japan and Germany.

Figure 9. Canadian Plastics Trade Orientation



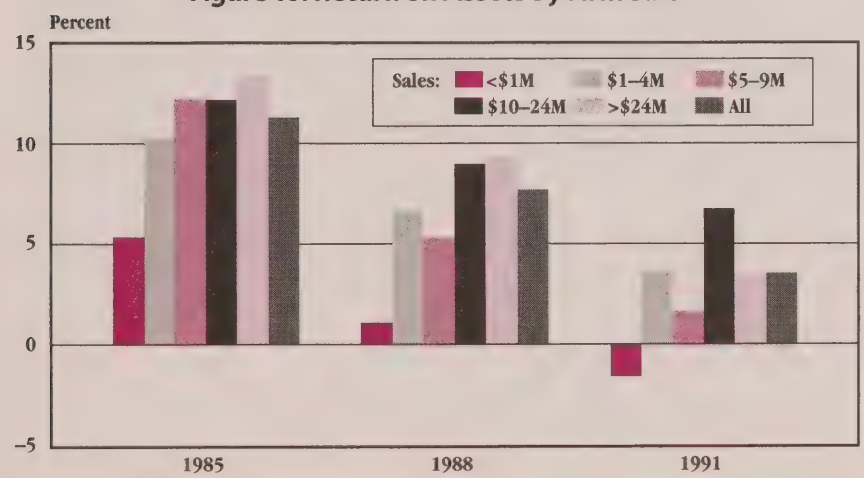
Source: Statistics Canada, TIERS CD-ROM.

Profitability

Profitability is the bottom line for any industry, but profit measures for the plastic products industry are very scarce, partly because of the limited number of publicly traded companies. Available historical financial data show that the larger establishments generally had the higher rates of return (Figure 10),

Profitability has been declining since mid-1980s

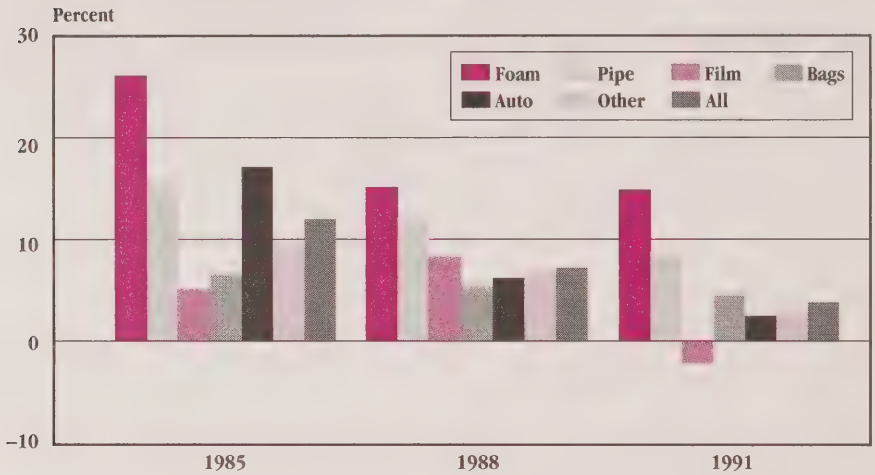
Figure 10. Return on Assets by Firm Size



Source: Statistics Canada, special request, 1995.

while among market segments, the foam sector was the most profitable (Figure 11). Also, while Canadian-controlled firms tended to be more profitable than foreign subsidiaries operating in Canada in 1985, the situation was reversed by 1991.

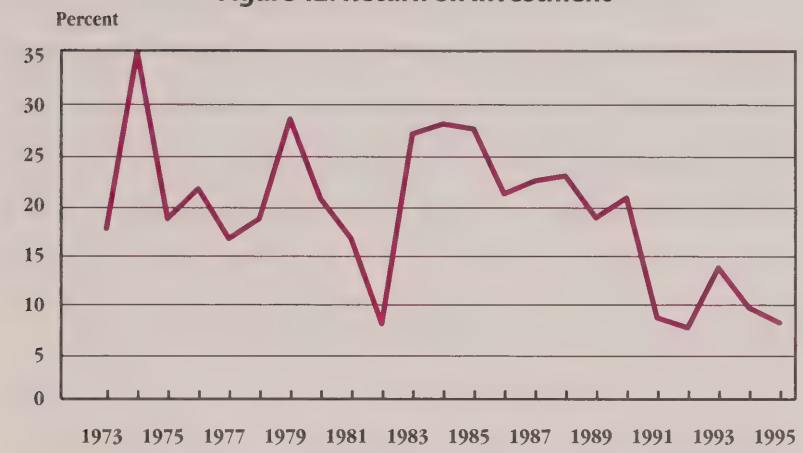
Figure 11. Return on Assets by Industry Subsector



Source: Statistics Canada, special request, 1995.

This decline in profitability is corroborated by the performance of the rate of return on investment (a measure of return on equity) published by CPIA and based on the information gathered in their annual Financial and Operating Ratios Survey (see Figure 12). Furthermore, the CPIA data indicate that the decline continued right up to 1995.

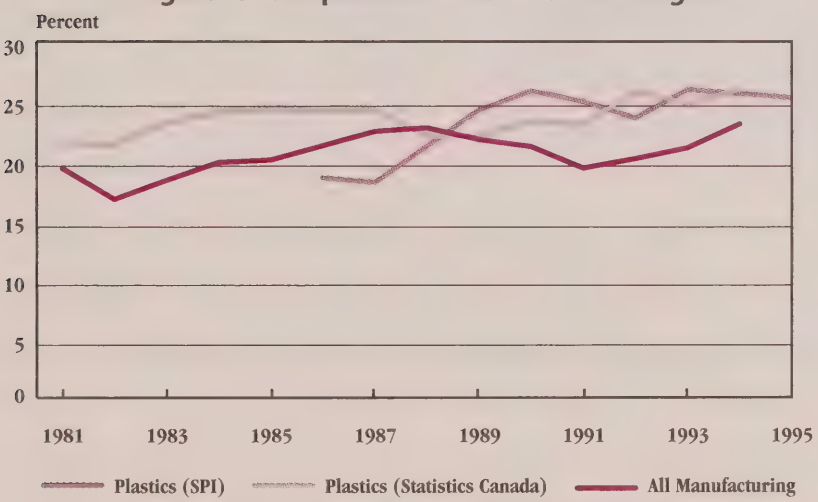
Figure 12. Return on Investment



Source: The Society of the Plastics Industry of Canada, Financial and Operating Ratios Survey, annual.

In addition to the performance of rates of return over time, it is important to know how one is doing compared to competitors. Figures 13 and 14 display proxy measures (because of the absence of better data) for gross profit margins — gross profits as a percentage of sales. In Figure 13, a comparison is made between the Canadian plastics industry and all manufacturing using

Figure 13. Comparison of Sector Gross Margins

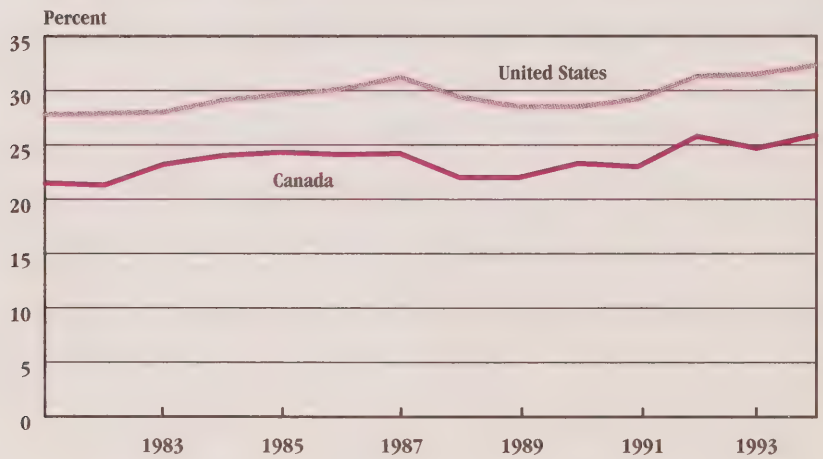


Source: Proxies for gross margin derived from Statistics Canada's CANSIM series D663247, -48 and -52 for plastics and CANSIM series D662147, -48 and -52 for all manufacturing, as well as SPI's Financial and Operating Ratios Survey, annual.

information from Statistics Canada's survey of manufacturers, and supplemented with information drawn from the CPIA survey mentioned above. (The latter measure is CPIA's definition of gross margins but with depreciation added in — about 4 percent annually.) The CPIA and Statistics Canada data for plastics show a consistent trend, suggesting that the plastics industry has held its own historically in terms of gross margins, and has done somewhat better than manufacturing as a whole since roughly the time of the implementation of the FTA.

Gross margins in the Canadian industry have consistently trailed those in the U.S. (Figure 14). This implies an impaired ability to compete, because of the relatively smaller flow of funds available internally to finance investment including R&D.

Figure 14. Comparison of National Gross Margins in Plastics



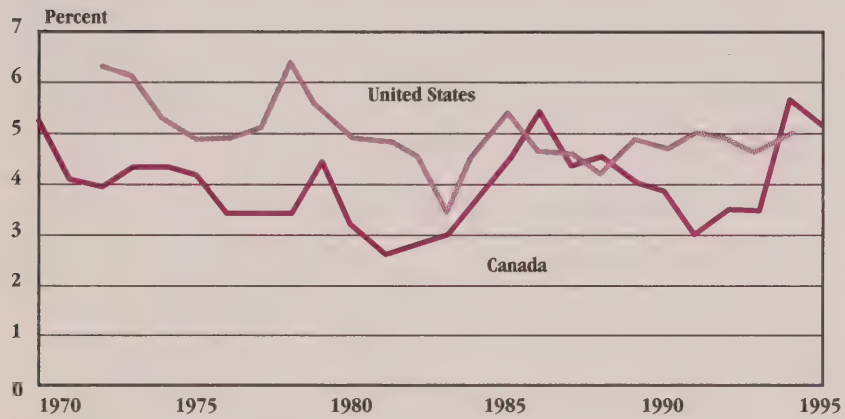
Source: Proxies for gross margin derived from Statistics Canada's CANSIM series D663247, -48 and -52 and U.S. Department of Commerce annual survey data for industry 308.

These data suggest little change in the relative position of the two countries' industries, while both show a slight upward trend in their margins since implementation of the FTA — perhaps as a result of rationalization and in spite of greater competition in both national markets.

Investment and Financing

Until the early 1980s, the U.S. plastic products industry typically reinvested more of its earnings in new capital equipment than did the Canadian industry, as evidenced by a ratio to sales (value of shipments) consistently 1–2 percent higher in the U.S. (Figure 15).

Figure 15. Capital Investment as a Share of Shipments



Source: Statistics Canada, Catalogue No. 61-214, annual, and CANSIM Matrix 3103; U.S. Department of Commerce, *Census of Manufactures for Industry 308*, annual.

In the mid-1980s, relative investment rates in the two countries were the same. In the late 1980s, the differential reappeared, but data for the most recent years indicate that the Canadian industry may once again have closed this gap.

Canada appears to have reinvested in technology, which should improve its competitiveness

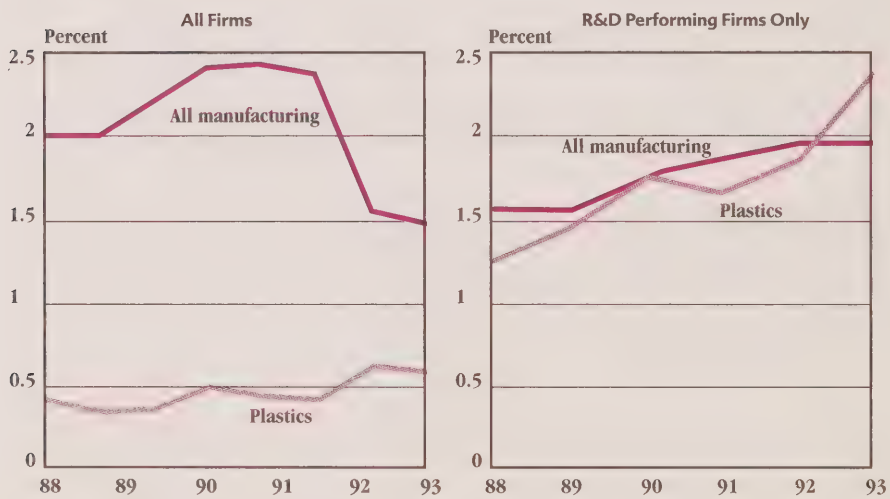
On the assumption that capital investment has a future payback in higher productivity through upgraded technology, the previously observed investment difference raised a concern for the competitiveness of the Canadian industry vis-à-vis the United States. If the most recent trend toward higher investment rates by the Canadian industry is sustained, one would expect to see this pay-off in terms of enhanced competitiveness relative to U.S. firms.

Technological Change

R&D spending is low; only a few companies benefit from innovative new products

Compared with all manufacturing, the plastic products industry's rate of R&D spending is very low (Figure 16, left-hand side); the Canadian plastic products industry has not been self-reliant in innovation. Meanwhile, some Canadian companies have invested in product and process innovations that have resulted in marketplace advantage, including ABC Group in automotive components, Royal Plastics in construction products and Winpak in packaging. The problem is not so much with the amount of R&D performed by firms that are doing R&D (see Figure 16, right-hand side) but with the small number of firms that are actually involved. Part of this shortfall is made up by the work done in the institutions mentioned previously and made available to all.

Figure 16. R&D as a Percentage of Shipments [a]

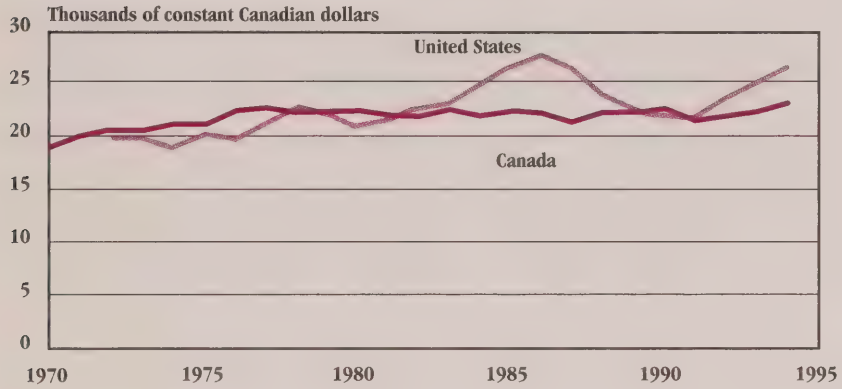


[a] Does not include establishments that manufacture automotive parts.
Source: Statistics Canada, Catalogue No. 88-202, annual.

Human Resources

Notwithstanding comparable wage and salary levels except for a spurt in the mid-1980s in the Canadian and U.S. industries (Figure 17), productivity as measured by real value-added per employee, began to diverge in the early 1980s and has stayed that way (Figure 18).

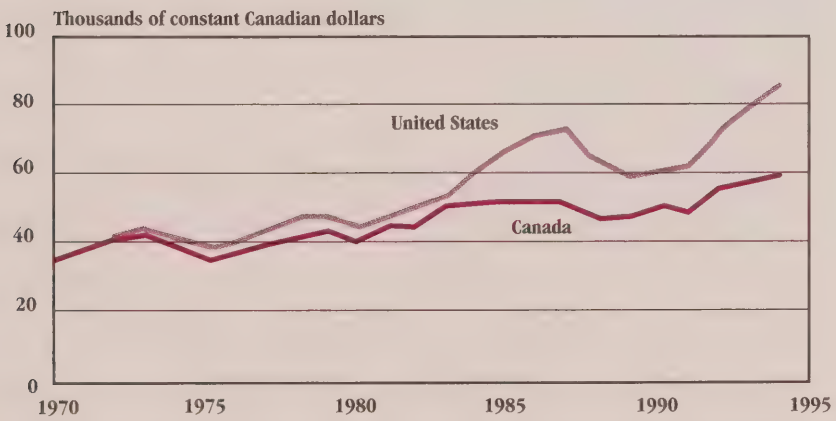
Figure 17. Average Plastic Products Industry Salaries[a]



[a] Constant 1986 dollars, with U.S. salaries converted to the Canadian equivalent using the average exchange rate for each year.

Source: Statistics Canada, CANSIM Matrices 5413 and 5560, annual; U.S. Department of Commerce, *Census of Manufactures for Industry 308*, annual.

Figure 18. Value-added per Plastic Products Industry Employee[a]



[a] Constant 1986 dollars, with U.S. salaries converted to the Canadian equivalent using the average exchange rate for each year.

Source: Statistics Canada, CANSIM Matrices 5413 and 5560, annual; U.S. Department of Commerce, *Census of Manufactures for Industry 308*, annual.

Canadian productivity lags behind U.S. firms that have invested in technology

This difference in productivity is believed to be linked to the aforementioned gap in investment intensity that existed between the Canadian and U.S. industries: U.S. firms may have shown a stronger commitment to productivity-enhancing technology. If this hypothesis is valid, and noting that the investment gap seems to have been closed, the result should be a narrowing of the productivity differential.

"... in the last five years the knowledge base has risen sharply, increasing by 11.1%."
— Nuala Beck, *Excelerate: Growing in the New Economy*, 1995

A study (Paul Johanis, "Smartening Up: Knowledge Workers in Canadian Manufacturing Industries," Statistics Canada, Ottawa, 1993) measuring "knowledge intensity" showed that plastics resided in the bottom third of all manufacturing industries in 1991. The positive news was that it had the largest gain over the period from 1986 to 1991. This indicates that the industry has been placing more emphasis on hiring and developing skilled workers, and that school and college programs have been responding to that need. While total employment levels may not grow very quickly in the near term, skill and presumably salary levels are expected to continue to increase.

3 CHANGING CONDITIONS AND INDUSTRY RESPONSE

3.1 Investment and Financing

Although certain segments of the industry such as pipe, profile and film have consolidated and compete on a North American basis, the industry on the whole is still fragmented. This has implications for investment and financing. With many end users rationalizing on a North American and in some cases a global scale, Canadian plastics processors need to adapt accordingly, and this often requires new equipment, technology and/or skills, all of which need financing.

Implications for investment include the fact that end users are rationalizing on a North American and global scale . . .

Furthermore, while growth has been rapid, many products are sold as highly price-competitive, commodities whose profit margins are low. This poses a problem in raising capital for equipment, R&D and skills upgrading.

low profit margins . . .

As with other industries composed largely of SMEs, there is ongoing difficulty getting financing. There is a perception that banks do not understand the industry or its companies. An effort is under way through the industry association to address this issue.

lack of understanding and support . . .

As Canadian companies mature, they reach a point where they are able to consider expansion. Often they are faced with a decision whether to invest in Canada or to establish a presence in the United States. An attractive investment climate in Canada is the best defence against plant and capital movement. This includes not only the direct construction and operating costs at a particular location, but also factors such as social structure, availability of skilled workers and access to technology support.

potentially more attractive U.S. investment possibilities

3.2 Trade

Trade is heavily skewed toward the United States, which accounted for 91 percent of exports and 78 percent of imports in 1995. For many products, this will always be the case, because transportation costs limit their export to more distant markets. However, in cases where a comparative technological advantage exists, diversification of the export base is possible. The industry's export orientation is much stronger in Canada than in the United States. Canadian firms can exploit this exporting knowledge to capture larger shares of U.S. and other foreign markets.

FTA and NAFTA are phasing out remaining tariffs on plastics within North America

With the maturing of the NAFTA speeding up the rationalization of end-use industries on a North American basis, some traditional customers for plastics processors are relocating. Often the cost of transportation precludes continuing to supply this customer from Canada, forcing the plastics processor to either establish a presence closer to the customer or lose the account.

3.3 Human Resources

The observed productivity gap between Canada and the United States has direct implications for human resources development. As companies move toward a stronger emphasis on technology, there is a parallel need to upgrade the skill level of the work force to utilize new technology effectively.

While certain segments of the plastic products industry have made attempts to upgrade their emphasis on human resources management, the industry as a whole appears to be trailing behind other industries in the area of training. While it formerly lagged its U.S. competitors (as shown in Figure 15), the Canadian industry has increased its investment in machinery and equipment substantially over the last number of years in response mainly to the introduction of new plastics manufacturing and processing technology, and increased competition. This increased expenditure on equipment and machinery will undoubtedly fuel the need for greater emphasis on education and training. Although the plastic products industry has been making some progress in these areas, consensus opinion is that the momentum must be maintained and expanded as the industry continues to raise its level of technological sophistication.

A recent study (ARA Consulting Group, "People in Plastics: Creating the Competitive Advantage," Ottawa, 1996) sponsored by Human Resources Development Canada (HRDC) has developed general recommendations designed to assist the plastic products industry in implementing strategies that will benefit both workers and firms. Some of the most substantive of these recommendations include:

- creating a sector council to coordinate human resources training and development
- creating a training trust fund through the sector council to collect and manage training budgets for participating firms
- creating national occupational standards and promoting their adoption in every province and every segment of the industry
- promoting recognition of diplomas, apprenticeships and certifications across provinces
- proposing guidelines for tracking the cost of training
- proposing standards for cross training to improve and broaden skills levels
- promoting basic skills upgrading
- promoting training for operators
- broadening the skills of managers.

3.4 Technological Change

Smaller Canadian firms are squeezed between technology change and lowered support from suppliers

One of the fundamental changes following the implementation of the FTA has been an accelerated rate of technological change. This is taking place at the same time as the increasing need for processors to invest more in R&D just to be able to compete in the larger market against U.S. firms, which have had higher rates of capital investment and productivity. Resin suppliers too have had to adjust to the FTA, leading to a reduction in technical support for the smaller companies typical of the Canadian processing industry.

In recognition of the need for greater R&D investment — particularly precompetitive, collaborative research — the Canadian industry and governments are exploring ways to encourage increased R&D. In Alberta, the Industrial Polymer Centre has been established, and discussions related to establishing a Plastics Technology Centre continue in Ontario. An objective of all parties is to link new and existing centres into a national network in support of the plastics industry.

3.5 Sustainable Development

"Plastics in several respects have been major contributors to improvements to the quality of life. . . ."
— Pierre Dubois, President and CEO, CPIA

Using plastics in place of other materials not only reduces costs and improves product performance, but also makes a positive contribution to sustainable development in many areas, as illustrated in the following examples.

Automotive parts Plastics are being used in ever-increasing automotive applications ranging from body panels to under-hood manifolds and cushioned instrument panels. When plastics displace metal parts, vehicle weight is lowered, and the resulting improved fuel economy conserves petroleum and reduces emissions of exhaust gases.

Packaging Plastics can deliver the desired packaging performance in forms that are lighter and less bulky than glass, metal and paper. This decreases the weight and volume of the final packaged product, conserving energy during their shipping.

Construction Vinyl windows and doors do not need to be painted, reducing emissions of paint solvents. It also improves the thermal efficiency of buildings, decreasing the amount of energy consumed for heating and cooling.

At the same time, the plastics industry is facing a number of environmentally related pressures that have the potential to restrict growth of this industry. Solid waste management as well as challenges to the use of PVC and possible links between plastics and endocrine disruptors are the issues of greatest current concern. Other issues are described in Annex C.

Solid waste Solid waste reduction was first focussed on packaging, although it is expanding to other areas, including automotive components and construction products. Progress in reducing packaging waste will continue to be measured against the targets of the National Packaging Protocol. The targets are to be achieved through the three R's, with reduction being the preferred option, followed by reuse and recycling. A number of scenarios exist for the plastic products industry to achieve the 50 percent waste diversion target by the year 2000.

Statistics Canada surveyed progress on solid waste reduction in 1990 and 1992. The data demonstrated increased recycling rates, a slight decline in domestic production of all packaging, including plastics, and a marked increase in unfilled packaging imports.

The current course of action is to encourage higher recycled resin content in new products. This alone is unlikely to meet the target unless consumers become willing to pay more for recycled products and/or the processing cost is reduced. In many cases, options exist to select recycled content goods that meet quality and cost criteria.

Plastic industry involved in "Three R's" — reduce, reuse, recycle . . .

plus a fourth "R" — energy recovery

Other measures are also lowering plastics disposal rates, such as reducing the amount of material used to form articles (thinner-walled packaging), and reusing containers.

Recovery of the energy content of plastics is another element for consideration in an integrated waste management strategy. Some streams of waste plastic (and other materials) cannot be recycled except at prohibitive cost. In these cases, there may be benefits to recovering its potential energy via well-controlled combustion.

Another option being developed is to use pyrolysis — the conversion of post-consumer plastics to high-value-added petrochemicals — as an additional component of this integrated strategy.

Polyvinyl Chloride

"Much evidence shows that PVC pipe is safe . . . a UN-sponsored forum on Chemical Safety found no amounts of dioxin at the parts per trillion level in 12 samples from six manufacturers."

— *Canadian Plastics*, June 1996

All industrial chlorine-based activity is currently under scrutiny. Led by Greenpeace, an international environmental research, education and advocacy organization, this concern first gained prominence in Europe, and began to receive increased attention in North America in about 1993. The 1993 report of the International Joint Commission for the Great Lakes recommended that production of chlorine-containing compounds in the Great Lake basin be banned — a recommendation that has been rejected by the federal governments in Canada and the United States.

In the plastics industry, the product under most scrutiny is PVC, for which an estimated 32 percent of industrial chlorine was used in 1993.

Much of the debate about the life cycle impact of PVC on the environment is occurring in the absence of conclusive scientific evidence. Industry and government have expressed an intent to cooperate in addressing these knowledge gaps. CPIA's Vinyl Council, Environment Canada and Industry Canada are taking the first step by developing a Memorandum of Understanding to address issues related to environmental performance and competitiveness over the life cycle of PVC. Industry-sponsored research to address the identified gaps will be critical to advancing understanding of PVC and its effects on the environment.

The PVC debate is also occurring in other parts of the world. As with most environmental issues, there is a need to monitor events internationally so that scientifically valid environmental goals can be achieved without taking any actions that would place Canadian companies at a competitive disadvantage.

Endocrine Disruptors

A broad range of chemicals is being investigated to determine whether they disrupt the normal hormone balance of living things. Some researchers have drawn links between the presence of these so-called endocrine disruptors in the environment and a variety of health problems in humans and animals, including:

- increased rates of testicular cancer and declining sperm quality in men
- increased rates of breast cancer in women
- population decreases and increased rates of deformity in wildlife.

Endocrine disruptors such as dioxin are cause for concern

The chemical species under scrutiny include acknowledged substances of concern like DDT, PCBs and dioxin. From the perspective of the plastics industry, the following commercially important chemicals are among those being studied:

- bisphenol A, which is used in the manufacture of polycarbonate and is present in some epoxies that are used to coat the inside of food cans
- phthalates, which are used as plasticizers in PVC
- nonylphenol, which is an additive in polymers like polystyrene and PVC.

The issue of endocrine disruptors has only begun to gain prominence over the past year or so. Environmental groups are using it as another component of their strategy to attack certain classes of chemicals, particularly those based on chlorine. Industry is mobilizing to defend its interests by supporting scientific research to establish which chemicals are truly of concern. Despite the efforts of industry, some jurisdictions, particularly in Scandanavia, are responding to public pressure and are imposing regulations in response to this issue.

4 GROWTH PROSPECTS

4.1 Demand Outlook

Canadian and worldwide demand for plastic products is expected to continue growing faster than overall economic growth, although not as rapidly as in the past.

Looking forward to the year 2000, the prospects for continued strong growth by the plastics industry appear very good. Projections by the industry and by forecasting consultants suggest real average annual growth of the order of 5–7 percent worldwide between 1995 and 2000. Growth will be highest in Asia Pacific and somewhat lower in North America and Europe. This growth figure is a blend between the fast-growing but lower-volume engineering resins, and the slightly slower-growing, high-volume, commodity resins.

North America consumes approximately one third of world resin production. Its growth in plastics consumption is expected to continue at roughly double the rate of growth in the economy, perhaps 3–4 percent per year. Given the more rapid growth in consumption in other regions of the world, Canadian plastics processors that develop export markets in these regions will experience even stronger growth.

Growth in demand for plastics worldwide should average 5–7% per year until 2000

"Plastics that are stronger than steel, new materials constructed atom by atom, 'intelligent materials' that are sensitive to changes in the environment . . . will transform many of the ways we make things from buildings to bridges to computer chips and automobiles."
— David Crane, *The Next Canadian Century*

When analyzed by end-use segment, packaging is the largest market for plastics. Use of plastics in packaging is expected to increase only slightly faster than the economy. Material substitution in favour of plastics is still occurring, albeit at a slower rate than in the past. Environmental pressure may also act to curtail this growth.

The North American construction industry is not expected to grow significantly in the next four years. Nonetheless, production of plastics construction materials is expected to perform quite strongly because of the increasing use of plastics as alternatives for other materials, and because of the diversification of markets into rapidly building, developing economies.

Lightweight and flexible plastics reduce auto weight, increase efficiency . . .

In automotive plastics, the forecast is particularly strong. Overall the automotive industry is expected to remain robust until the year 2000. In addition to this growth factor, plastics are making even greater inroads by displacing steel and other metals. Automobile makers are switching to plastics at an accelerating rate because it is lightweight, corrosion-resistant, flexible and comparatively inexpensive to tool.

decrease costs . . .

house high-tech machines

One other very high growth end market for plastics is in business machines and telecommunications equipment. In products such as computer housings, telephone handsets and compact disks (CDs), plastics are the materials of choice. Demand for these products is projected to increase very rapidly, creating a similar strong demand for the plastics used in these applications.

4.2 Key Industry Strengths

The plastic products industry is largely Canadian owned and controlled, so the key decisions affecting its future competitiveness will be made in Canada.

The industry's export orientation generally is much stronger in Canada than in the United States. Canadian firms can exploit this exporting knowledge to capture larger shares of U.S. and other foreign markets.

The plastics automotive components industry is concentrated in southern Ontario. This area is very close to a strong mid-continent automotive sector that is becoming increasingly reliant on just-in-time scheduling.

Skill upgrading appears to be under way. This trend is critical as Canadian companies strive to move to the leading edge of technology.

". . . New technologies and processes are being introduced, and . . . innovation is taking hold ."
— Nuala Beck,
***Excelerate: Growing in the New Economy*, 1995**

4.3 Current and Anticipated Challenges

Although the plastics industry is not as intensive in technology as some other industries, the fact that its rate of spending is so much lower than the average for all manufacturing is of concern. The issue here is not so much the rate of expenditure by R&D performers, but rather the relatively low proportion of companies that are engaged in R&D. Because so many companies fall into the SME category, there would seem to be a need for increased collaboration among industry participants.

Challenges include . . .

low R&D . . .

low capital investment . . .

Capital investment rates have typically been lower in Canada than in the United States. This higher rate of spending is believed to have been largely responsible for the gap between U.S. and Canadian productivity. Recent investment data suggest that the Canadian industry may have eliminated this differential. If sustained, this augmented investment rate can be expected to emerge as a key strength in coming years, allowing the industry to improve its competitive position.

consolidation of smaller firms . . .

Larger firms are proportionately more dominant in the United States. While size is not beneficial in all instances, it often permits economies of scale. Greater collaboration or consolidation within the Canadian industry could therefore be beneficial by making it easier to negotiate favourable raw materials contracts, gain preferred access to supplier technology and become self-reliant for technical innovation.

a trade deficit position . . .

A trade challenge is to maintain the momentum in reducing the trade deficit (Figure 9). Canada has sizable deficits not only with countries where low wages provide a competitive advantage, but also with countries with higher wages such as Japan and Germany. Although direct cost competition with low-labour-cost countries might be out of the question, there are other ways to compete. For example, while NAFTA impacts might be uncertain, there could be potential for Canadian companies to supply technology in joint ventures with Mexican firms.

In the area of human resources, the challenge is to continue to raise overall skill levels. In this regard, the recommendations contained in the HRDC-sponsored study mentioned previously need to be carefully assessed and, where support exists, implemented as quickly as possible.

need for skill upgrading . . .

The plastic products industry must continue to promote its contribution toward the objectives of sustainable development, and at the same time respond to environmental issues that have the potential to curb growth within the industry.

environmental constraints

4.4 Future Opportunities

More companies need to become exporters, and those that already export need to become more aggressive in expanding their foreign markets. The market that offers the biggest potential for both new and established exporters is still the United States.

Opportunities lie in . . .

Established exporters are more likely to be in a position to expand into offshore markets, particularly with products that possess a technological advantage.

export to U.S. . . .

For many products, high transportation costs preclude direct export to distant markets. In these cases, companies should seek joint venture, acquisition or alliance opportunities so that Canadian companies can extend their reach by exporting and exchanging technology.

joint ventures into global markets . . .

through integrated strategies . . .

Beginning in 1996, Canada's International Business Strategy has taken a more holistic approach to the plastics sector. The sector encompasses producers of resins, machinery and moulds as well as processors. This integrated strategy builds upon the mutual interests of each of the subsectors and has potential for increased overall impact in foreign markets.

through focussed trade assistance groups

The Ontario and Alberta consultations both recommended the creation of focussed trade assistance groups. These bodies would provide companies with information on foreign markets, export logistics, product marketing, etc., on a fee-for-service basis.

4.5 The Bottom Line

The plastic products industry has recovered strongly since 1992 in response to an improved business cycle and strong U.S. exports fuelled by a low Canadian dollar.

Though improving, Canadian plastic industry's position lags behind the U.S.

However, underlying indicators suggest that the Canadian industry may be lagging behind U.S. plastics firms in preparing for future competition. By other measures, Canada is on a par or already has a comparative advantage. By responding to areas where Canadian firms may be at a disadvantage and by building upon existing strengths, the plastic products industry has an excellent opportunity to enhance its competitive position.

The industry is positioned for success

Overall, the Canadian plastic products industry is well positioned for continued success in Canadian and foreign markets. By taking corrective action to counter the areas of weakness described in this document, the industry has the potential to dramatically shift the balance of competitiveness in favour of Canadian firms.

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Annex A
INDUSTRY STATISTICS

The statistics for major group 16, Plastic Products Industries, include five 4-digit SICs: 1611 — Foamed and Expanded Plastic Products, 1621 — Plastic Pipe and Pipe Fittings, 1631 — Plastic Film and Sheeting, 1691 — Plastic Bags and 1699 — Other Plastic Products. Plastic automotive parts fall within SIC 3256.

I. Principal Statistics

	1990	1991	1992	1993	1994	1995 [a]
Establishments						
Plastic products	1 294	1 207	1 153	1 153	1 132	1 130
Plastic auto parts	75	69	70	68	66	65
Total	1 369	1 276	1 223	1 221	1 198	1 195
Employment						
Plastic products	51 882	50 758	49 348	50 410	53 168	55 000
Plastic auto parts	10 317	9 560	10 220	11 595	11 771	12 200
Total	68 199	60 318	59 568	62 005	64 939	67 200
Shipments ($ millions)						
Plastic products	5 997	5 649	5 766	6 193	7 102	7 700
Plastic auto parts	1 140	1 032	1 107	1 420	1 727	1 750
Total	7 137	6 681	6 873	7 613	8 829	9 450

[a] Data for 1995 are Industry Canada estimates.

II. Trade Statistics

	1990	1991	1992	1993	1994	1995
Imports ($ millions)	2 294	2 364	2 699	3 044	3 587	3 938
Exports ($ millions)	1 270	1 269	1 540	1 892	2 475	2 962
Domestic market ($ millions)	8 161	7 776	8 032	8 765	9 941	10 476

III. Total Level of Plastics Processing Activity, Broken Down by Detailed Commodity Groupings, and Including In-house Consumption

Commodity type	Establishments	Shipments ($ millions)	Employment
PVC siding	20	380	1 730
Other profiles	57	300	2 240
Rigid pipe and fittings	82	720	3 900
Floor and wall coverings	13	120	830
Polyethylene PSF[a]	87	560	2 930
Other non-reinforced PSF	91	810	4 070
Reinforced PSF	56	620	3 140
Polystyrene insulation	33	180	870
Other foamed sheets	65	390	2 730
Plumbing fixtures	68	320	2 500
Bags	144	1 220	8 220
Bottles	81	540	4 410
Other containers	192	1 030	8 490
Kitchenware, houseware	94	510	4 090
Builders ware	211	670	6 530
Automotive parts	85	2 410	12 130
Synthetic fibres	43	1 400	5 540
Miscellaneous	622	1 540	13 950
Total plastic products	1 600[b]	13 720	88 300
In-house production	500	3 320	15 400
TOTAL ACTIVITY	2 100	17 040	103 700

[a] PSF = plate, sheet and film.

[b] Estimated number of unique establishments producing plastic products for sale; number is less than sum for all commodity types because some establishments produce more than one commodity.

Annex B
PROFILES OF SELECTED KEY FIRMS

ABC Group

ABC Group, headquartered in Toronto, Ontario, is the largest automotive parts blow moulder in North America. The privately held company comprises more than 20 manufacturing plants. Most are located in Canada; others are located in the United States, Mexico, Europe and Japan. While most of its activities relate to plastic automotive components, ABC also produces products for other markets, including packaging and electronic equipment.

Sales were estimated to be $400 million in 1995, and the company employed about 1800 people. ABC is integrated into resin compounding, and machinery and mould design and construction.

AT Plastics

AT Plastics, headquartered in Brampton, Ontario, was formed through a management buyout of the plastics operations of ICI Canada in 1989. AT manufactures specialty resins and agricultural film in Edmonton, Alberta, and packaging film in Brampton, Ontario. Company sales were $205 million in 1995: approximately 60 percent from resins and 40 percent from film. Overall the company employed about 600 people. The company had been private until the launch of an initial public offering in February 1994.

Bonar

Bonar has its headquarters in Burlington, Ontario, and operates three plants in Canada. The parent company, Low and Bonar PLC, is located in Scotland. Estimated sales for 1995 were $250 million, and Canadian employment was 1200. Bonar manufactures a range of packaging products, including plastics, paper and laminated combinations.

Canadian General-Tower

Canadian General-Tower (CGT) is a privately held company located in Cambridge, Ontario, where it also operates its only manufacturing plant. Estimated sales for 1995 were $120 million, and the company employed 600 people. Most of CGT's output is calendered PVC and PVC-coated fabrics that are sold to automotive, consumer and industrial markets.

Decoma

Decoma is the plastic automotive parts subsidiary of Canada's largest Tier One supplier — Magna. Headquarters are in Concord, Ontario. Decoma operates 13 plants in North America, and is involved in joint ventures with three others. Estimated sales from plastics processing were $550 million in 1995, and 2500 people were employed. Decoma specializes in exterior systems and components, which are supplied to a number of automotive assemblers.

Domco

Domco, located in Farnham, Quebec, was recently acquired by Sommer Allibert of France. The company has two U.S. subsidiaries. Sales for 1995 were $316 million, and employment was estimated to be about 800. Domco manufactures PVC floor coverings for commercial and residential markets.

Great Pacific Enterprises

Great Pacific Enterprises, based in Vancouver, British Columbia, was formerly known as International Innopac. Great Pacific Enterprises is publicly traded and operates 10 manufacturing plants in Canada. Sales in 1995 were $266 million, and employment was estimated to be 1400. The company is diversified into many types of packaging and packaging-related products, although plastics represent the bulk of its activity.

Groupe Hamelin

Hamelin Group is based in Boucherville, Quebec. It operates six plants in Canada and one in the United States. The company is privately held. Corporate sales for 1995 are estimated to be about $100 million, and total employment was about 600. Hamelin produces a broad range of products for packaging and consumer markets. The company also owns Korlin Concentrates, a custom compounding operation.

IPEX

IPEX was formed through a merger of the pipe businesses of Scepter Manufacturing and Canron in 1992, creating the largest plastic pipe manufacturer in North America. Corporate headquarters are located in North York, Ontario, and the company operates 11 plants across the country.

Estimated sales for 1995 were $250 million, employing a work force of 1000 people. The company produces pipe for a number of markets, including municipal infrastructure, plumbing and electrical conduits.

Intertape Polymer Group

Intertape Polymer is based in Montreal, Quebec, and operates four plants in Canada. Company sales for 1995 were $225 million, employing 700 people. Intertape produces a wide range of packaging products for diverse end-use markets.

Jannock

Jannock, based in Toronto, Ontario, is a diversified construction products company that operates four plants that process plastics. Corporate sales for 1995 were $1100 million, with its plastics activities responsible for an estimated $230 million and employing about 700 people. Jannock manufactures plastic products such as PVC siding (Daymond) and polystyrene foam insulation (Celfort Construction Materials).

Kautex

Kautex, located in Windsor, Ontario, is owned by Klockner-Werke AG of Germany. Two plants are operated in Canada. Estimated sales for 1995 were $120 million, and employment was 250. The company specializes in plastic fuel tanks for automobiles, with minor output of large hollow containers for non-automotive applications.

Royal Plastics Group

Royal Plastics, based in Woodbridge, Ontario, is North America's largest extruder of PVC construction products. Founded in 1970, the company has grown to include more than 40 wholly or jointly owned manufacturing businesses in Canada, the United States and Mexico. The company had been privately held until the issue of an initial public offering in the fall of 1994.

Royal produces window profiles, siding, pipe, vertical blinds and doors. In 1995, it had estimated sales of $500 million and employed about 2200 people. The company is highly integrated: it compounds its own resin and manufactures most of its machinery and moulds.

Recently Royal has begun to commercialize proprietary technology for constructing houses from modular PVC components. This novel housing system technology was initially sold to developing countries in need of high volumes of low-cost housing. More upscale models are now being developed that will have greater appeal in Canada and other industrialized countries.

Twinpak

Twinpak is based in Dorval, Quebec, and operates 13 plants across the country. The parent company, Amcor, is headquartered in Australia. Estimated sales for 1995 were $200 million, employing 1200 in Canada. Twinpak manufactures a broad range of rigid and flexible plastics packaging products.

Uniplast

Uniplast Industries, based in Orillia, Ontario, operates two plants in Canada and four in the United States. Estimated sales for 1995 were $100 million. Uniplast manufactures film for commodity packaging and niche applications. The company has developed specialized technology for producing embossed film that it exports to distant markets.

Winpak

Winpak, headquartered in Winnipeg, Manitoba, manufactures plastics packaging at eight production facilities in Canada and the United States. Most products are intended for food packaging, with smaller quantities being used for health care and industrial applications. Winpak is one of the leaders in developing and promoting modified atmosphere packaging for extending the shelf life of unfrozen foods. The company is 52 percent owned by Wihuri Oy of Finland, with whom it has a reciprocal technology exchange agreement.

Annual sales were $280 million in 1995, and total employment was about 2000. Over the past few years, Winpak has grown through acquisitions, the latest two being PNG Packaging (now Winpak Technologies) in 1992, and Portion Packaging (now Winpak Portion Packaging) in 1993.

Woodbridge Group

Woodbridge is headquartered in Mississauga, Ontario. It operates more than 20 plants, most of which are in Canada and the United States, but with others located in Mexico and Europe. Estimated sales for 1995 were $850 million, with employment of 4500. Production of its urethane foam is heavily oriented toward automotive seats and secondarily to consumer applications.

Annex C
OTHER ENVIRONMENTAL ISSUES

New Substance Notification

As part of the "cradle to grave" management approach to toxic substances, regulations under CEPA are intended to ensure that no new substance is introduced into the Canadian marketplace before it has been assessed for risks to human health and the environment. The new substances program includes identification criteria, an assessment mechanism and powers to implement special controls.

Volatile Organic Compounds and Nitrogen Oxides

Volatile organic compounds (VOCs) and nitrogen oxides (NO_X) react in the presence of sunlight to form ground-level ozone, a major component of urban smog. In 1988, at the request of the Canadian Council of Ministers of the Environment (CCME), a three-phase plan was developed to manage NO_X and VOCs release. While plastics production produced only 0.8 percent of total VOC emissions in 1985, projected growth led to reduction targets and plans for the four subsectors that produce 60 percent of this industry's emissions.

Ozone-depleting Chemicals

The use of certain ozone-depleting chemicals — chlorofluorocarbons (CFCs) — is being reduced and eventually banned under the 1987 Montreal Protocol, an international accord to protect the stratospheric ozone layer that shields the earth from dangerous levels of ultraviolet radiation. The plastic products industry has switched from CFCs used as blowing agents to make foam to more costly hydrochlorofluorocarbons (HCFCs). HCFCs themselves are only a temporary solution, and the industry will switch again to even more environmentally friendly chemicals when the technology is developed.

Strategic Options Process

Substances identified as posing risk to human health and the environment through CEPA assessment are subject to the Strategic Options Process (SOP) to identify options for reducing exposure in the environment to acceptable levels. Of 25 chemical groups so far identified as being toxic, four have a potential impact on the plastic products industry.

Accelerated Reduction/Elimination of Toxics

The Accelerated Reduction/Elimination of Toxics (ARET) is based on the premise that voluntary action by users and emitters of toxic substances may be quicker, more effective and less costly than traditional regulatory control. Through ARET, emitters participate in an open and non-prescriptive planning process for reducing/eliminating toxics. This approach permits flexibility and can provide an opportunity to improve corporate image, gain public support and strengthen competitiveness.